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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,865	04/13/2004	Rene Hubert Jacobus Carpaij	081468-0309160	2650
909	7590	03/15/2005	EXAMINER	
PILLSBURY WINTHROP, LLP			SOUW, BERNARD E	
P.O. BOX 10500			ART UNIT	
MCLEAN, VA 22102			PAPER NUMBER	
			2881	

DATE MAILED: 03/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/822,865

Applicant(s)

CARPAIJ ET AL.

Examiner

Bernard E. Souw

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 April 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Specification*

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-7 and 11-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Stoeldrijer et al. (USPAT 6,404,499).

Stoeldrijer et al. disclose a lithographic apparatus comprising an illumination system for providing a projection beam of radiation, as shown in Fig.1; a support

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structure MT for supporting a patterning device MA, the patterning device serving to impart the projection beam with a pattern in its cross-section; a substrate table WT for holding a substrate W; a projection system PL for projecting the patterned beam onto a target portion of the substrate W, as recited in Col.3/II.43-67 and Col.1/II.1-5; Col.4/II.36-37 and Col.5/II.1-14; Col.7/II.19-40 and Col.8/II.16-22 in reference to Fig.2; Col.8/II.36-39 in reference to Fig.4 and Col.8/II.64-67 and Col.9/II.1-17. More specifically, Stoeldrijer et al. disclose a first illumination system by using a first filter and a second illumination system by using a second filter for providing a compensating beam of radiation to predetermined areas on the substrate, as recited in Col.5/II.15-30 in reference to Fig.4, and more generally, a plurality of illumination systems by the use of a plurality of filters, as recited in Col.4/II.36-67 & Col.5/II.1-14; wherein each of the filters provides an intensity of compensating beam that is differently and substantially varied across the predetermined area.

While the above recitation anticipates the limitations of independent base claims 1 and 11, the further limitations regarding different variations of illumination intensity are anticipated by Stoeldrijer et al. in Col.9/II.18-34, which recites a digital filter that may be designed to have each or all the characteristics recited in claims 2-7 and 12-18.

4. Claims 1, 3, 7, 11, 16 and 18 are also rejected under 35 U.S.C. 102(a) and (e) as being anticipated by Kim et al. (USPGPUB 2004/0214094).

Regarding claims 1, 3, 11 and 16, Kim et al. disclose a lithographic apparatus comprising an illumination system for providing a projection beam of radiation, as shown

in Figs.5 and 8; a support structure 805 shown in Fig.8 for supporting a patterning device 805c (or mask 111 shown in Fig.1), the patterning device serving to impart the projection beam with a pattern in its cross-section; a substrate table 809 for holding a substrate 807; a projection system 503-505-507-509 shown in Fig.5 for projecting the patterned beam onto a target portion of the substrate 807 (with numeral 501 being the same as numeral 805 in Fig.8), as recited in sect.[0030]. More specifically, Kim et al. disclose in sect.[0012] --and further in claims 7, 28 and 45-- a first and a second illumination systems for providing a compensating beam of radiation to predetermined areas on the substrate, the intensity of the compensating beam being substantially varied across the predetermined area, as expressly recited in sect.[0034]/II.7-15 and sect.[0035]/II.7-14 in reference to Fig.2.

Regarding claims 7 and 18, Kim's compensating beam has an annular illumination area, as specifically recited in sect.[0012], [0042] and [0044], and further in claims 8, 29, 46 and 62. These two claims are additionally (or alternatively) rejected under 35 U.S.C. 103(a) as being unpatentable over Stoeldrijer et al. or Kim et al. in view of Kinney et al. (USPAT 6,809,809) (see later).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stoeldrijer et al. or Kim et al..

Stoeldrijer et al. or Kim et al. show all the limitations of claims 8 and 9, as previously applied to the parent claim 1, except the recitation of a second substrate table for holding the (same) substrate during exposure (claim 8), this second substrate table being provided in a separate portion relative to the first illumination system.

With all other limitations being already inherent to claim 1 with regard to the first substrate, which have been previously rejected over Stoeldrijer et al. or Kim et al., the court held that mere duplication of parts (in this case a duplication of the first substrate table) has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960).

It would have been an obvious matter of design choice to use a second substrate table for holding the (same) substrate during a second exposure recited in claim 1, since applicant has not disclosed that using such a second substrate table would solve any stated problem or has any particular purpose, and it appears that the invention would perform equally well with a mere duplication of the first substrate table of claim 1. Therefore, Applicant's use of a second substrate table is a mere matter of design choice that is unpatentable, because it only involves routine skill in the art.

7. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al..

Kim et al. show all the limitations of claims 20 and 21, as previously applied to the parent claims 1 and 11, also including the recitation of a device manufactured by Kim's lithographic apparatus. This limitation is inclusively recited in sect.[0004], which specifically recites the lithographic apparatus being used for producing a uniform critical dimension in a semiconductor device.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Kim's lithographic apparatus for manufacturing a semiconductor device, in order to compensate for a decreasing intensity of illumination towards the wafer's edge as a result of diffraction effect, as taught by Kim et al. in sect.[0007] and [0008], as well as due to other effect(s), as recited in sect.[0036].

One of ordinary skill in the art would have been motivated to modify the patterning intensity by a compensating with a varying intensity of illumination across the wafer's area as taught by Kim et al., in order to compensate for an otherwise varying characteristic performance of the semiconductor devices produced over the wafer as a result of varying critical dimension across the substrate.

8. Claims 7 and 18 are also (i.e., additionally) rejected under 35 U.S.C. 103(a) as being unpatentable over Stoeldrijer et al. or Kim et al. in view of Kinney et al. (USPAT 6,809,809).

Stoeldrijer et al. or Kim et al. show all the limitations of claims 7 and 18, as previously applied to the parent claim 1, except the recitation that the substrate table is formed and arranged to rotate the substrate during the exposure substrate table during

the exposure. Instead of rotating the substrate, Kim's apparatus provides an intensity compensation in the form of an annular area of substrate exposure, as recited in sect.[0012], [0042], [0044], as well as in claims 8, 29 and 46.

Kinney et al. disclose a projection apparatus comprising a substrate 270 on a substrate table shown in Fig.5B, which can be rotated about an axis 299, as recited in Col.16/ll.23-27.

A recitation of the intended use of a claimed invention --in this case Applicant's intended use of the rotation to expose an annular area with the compensating beam that may be different than Kinney's-- must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Therefore, Applicant's differing purpose does not alter the conclusion that Applicant's use of a prior art device (Kim's as modified by Kinney's) having a substrate table that can be rotated, would be *prima facie* obvious from the purpose disclosed in the reference. *In re Lintner*, 173 USPQ 560.

9. Claims 10 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stoeldrijer et al. or Kim et al. in view of Lee et al. (USPAT 6,534,221).



Stoeldrijer et al. or Kim et al. show all the limitations of claims 10 and 19, as previously applied to the parent claim 1, except the recitation of an Optical Edge Bead Removal (OEBR) system adapted to provide the compensating illuminating radiation.

Lee et al. disclose a lithographic apparatus similar to Stoeldrijer's and Kim's, including a provision to vary the intensity across the illumination area, as recited in the Abstract/ll.13-27, Col.6/ll.17-26 in reference to Fig.19 and Col.7/ll.25-39 in reference to Figs.7a-d and Fig.8. One embodiment of Lee's provision for varying the intensity across the illumination area is also called an OEBR system, as specifically recited in Col.7/line 31.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the intensity across the illumination area in Stoeldrijer's or Kim's lithographic apparatus by an OEBR system as suggested by Lee et al., since such a system is a standard system that is commonly and easily available as a ready-to-use device, as implicated by Lee et al. in Col.7/ll.29-31.

One of ordinary skill in the art would have been motivated to modify Stoeldrijer's or Kim's lithographic apparatus by Lee's OEBR system, since using such a standard device that is ready-to-use would save time and man-hour rather than to build from scratch.

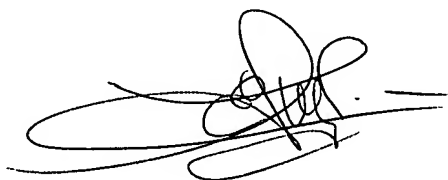
### ***Communications***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 571 272

2482. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571 272 2477. The central fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for regular communications as well as for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

A handwritten signature in black ink, appearing to read 'Bernard E. Souw', with a large, stylized flourish extending to the left.

Bernard E. Souw

Patent Examiner – AU 2881

March 09, 2005